Electronic Supplementary Information (ESI)

Hierarchical hollow ZnO cubes from self-sacrificial ZIF-8 frameworks and their enhanced benzene gas-sensing properties

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1. Materials synthesis

1.1 Synthesis of basic zinc carbonate

Typically, 1.115g (3.75mmol) $Zn(NO_3)_2.6H_2O$ was dissolved in 2.5ml water. 0.498g (6.3mmol) ammonium bicarbonate was dissolved in 5ml water. After that, the zinc nitrate solution was slowly added into ammonium bicarbonate solution under stirring for 30min. White precipitates was observed and aged for 1h. The products was collected by centrifugation and washing with water three times, then dried at 80 °C overnight.

1.2 Synthesis of singular 0D ZnO particles

The as-synthesized basic zinc carbonate was calcined at 450 °C for 1h in a muffle furnace with a heating rate of 1 °C min^{-1}. The products were donated as ZnO-S.

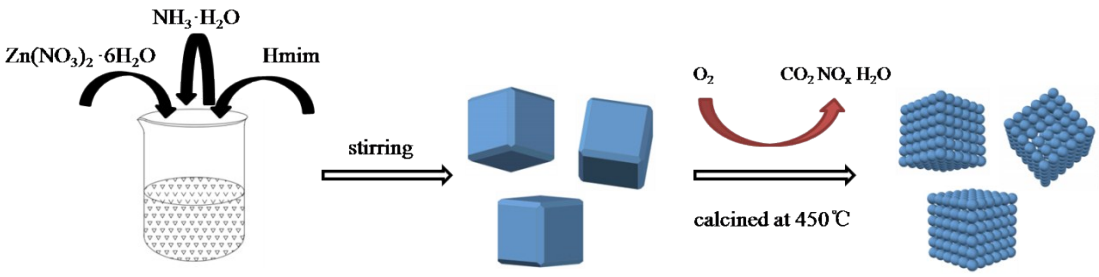

Fig. S1 Schematic illustration of process to synthesize hierarchical porous ZnO hollow cubes from ZIF-8 frameworks

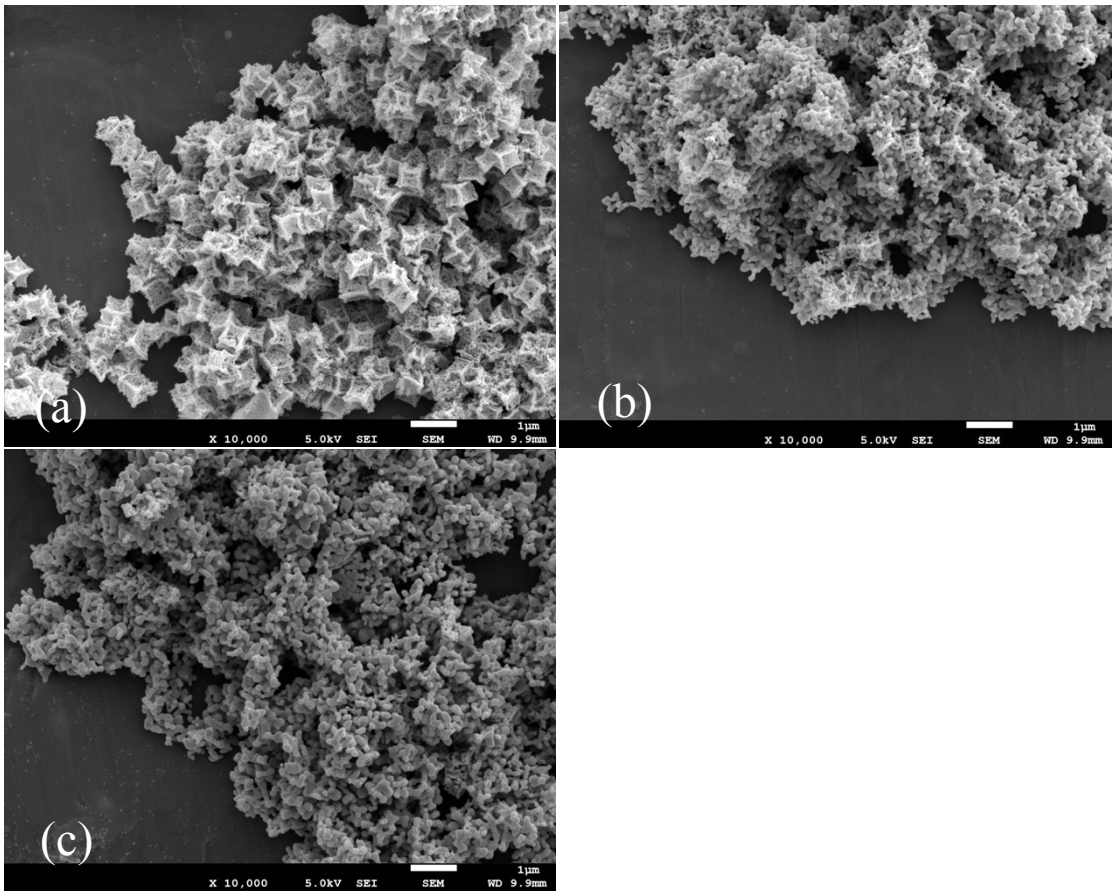

Fig. S2 SEM images of ZnO at different pyrolysis temperature (a) 450 °C, (b) 550 °C, (c) 650 °C.

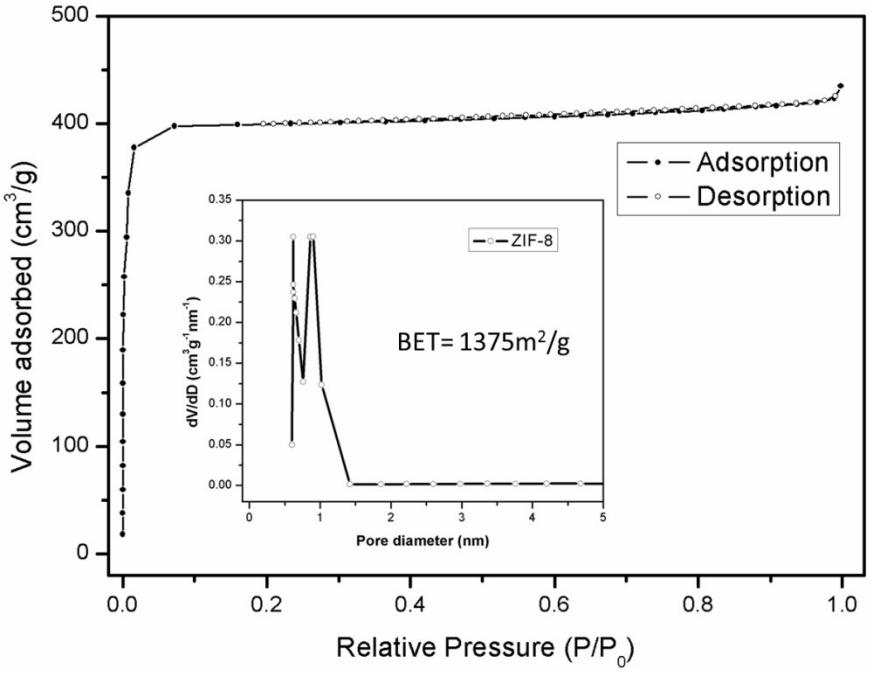

Fig. S3 N_2 adsorption–desorption isotherms and pore distributions of ZIF-8

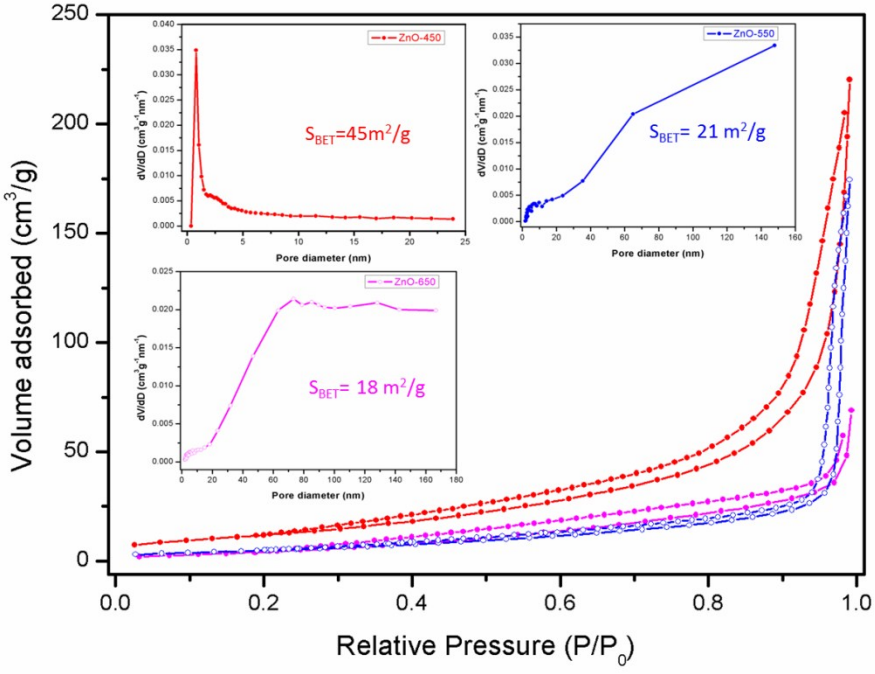

Fig. S4 N_2 adsorption–desorption isotherms and pore distributions of ZnO at different pyrolysis temperature

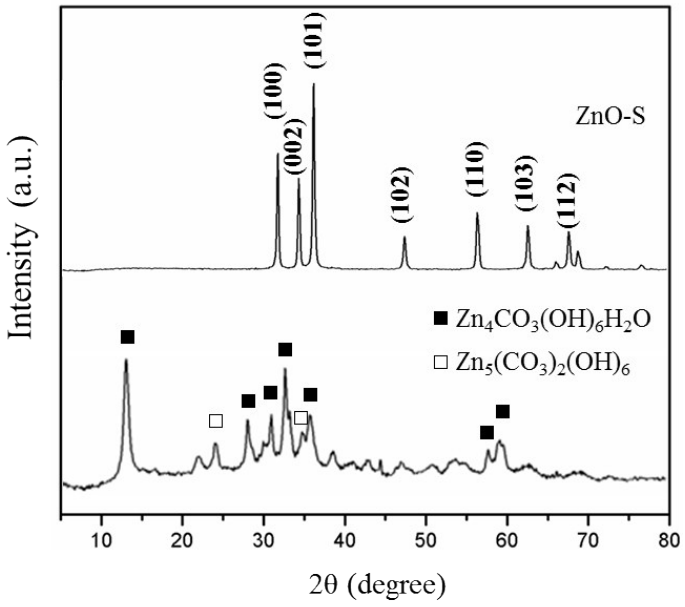

Fig. S5 XRD patterns of basic zinc carbonate precursors and singular 0D ZnO particles

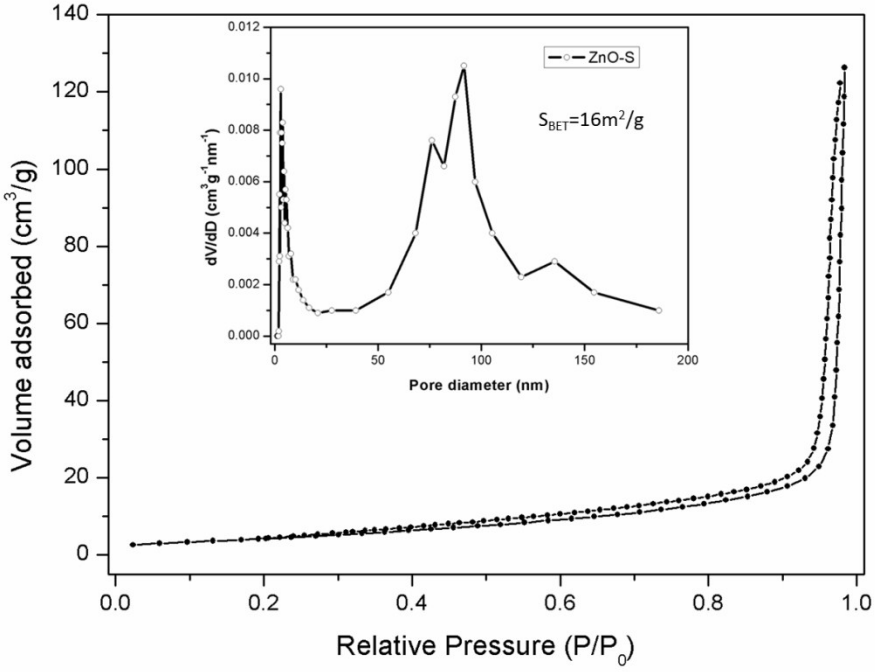

Fig. S6 N_2 adsorption–desorption isotherms and pore distributions of ZnO prepared from basic zinc carbonate